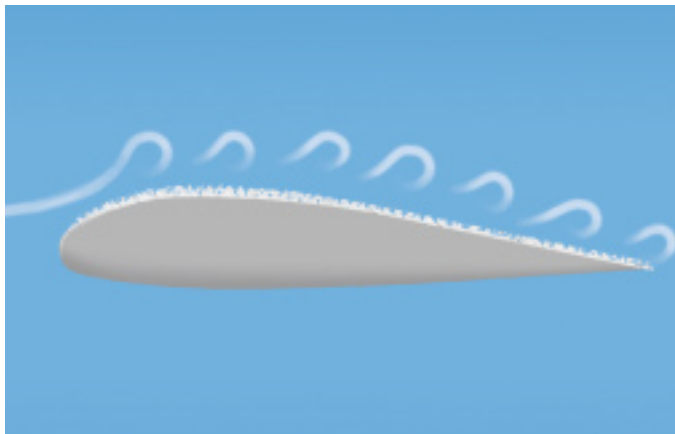


## Cold Facts: Wing Contamination

During the last 10 years, there have been over 30 accidents on takeoff as a result of wing contamination by snow, frost, and ice. A few simple steps during preflight could have easily prevented these accidents.

Frost and snow often accumulate on wings, elevators, and other surfaces when an aircraft is parked outside on the ramp. The disrupted airflow over the wings can substantially alter flight characteristics. Increased stall speeds, longer takeoff rolls, or an inability to fly at all may be the result. Even a passing snow shower can foul surfaces enough to make flight inadvisable.



*Smooth boundary layer flow over airfoils is critical to safe flight—degrade it with any snow, frost, or ice and flight may not happen.*

When frost or snow is present on the airframe, the pilot has two choices: go home or spend some extra time during preflight **completely removing** frost and snow from the aircraft. While no Federal Aviation Regulations (FARs) specifically prohibit a light general aviation (GA) aircraft from attempting a takeoff while covered in snow or frost, doing so may fall under careless and reckless operation (FAR 91.13).

In December 2004 the National Transportation Safety Board (NTSB) mailed pilots an alert letter urging them to *look at and feel* the aircraft's wings during preflight to ensure no ice is present.

### Clean it up!

The best and easiest way to prevent contamination is to park the aircraft in a hangar.

In the highly regulated airline world the rule is simple: an aircraft can depart only when it's 'clean' - no snow, frost, or ice on any part of the aircraft. GA pilots should use the same winter operations principle.



If the aircraft is snow-covered, consider using soft bristle brooms or small snowbrushes. While effective, they can scratch paint, so use care. Clean towels or shop rags will also remove snow without scratching the paint.

The bad news is that underneath the snow there may be a layer of ice that also needs to be removed. Removing frost and ice is trickier than loose snow, but just as critical. The best tool is a heated hangar and an hour to spare. When melting the frost and ice make sure water does not penetrate control surface hinges where it might refreeze and cause problems.

From an aerodynamic viewpoint, there is no such thing as “a little ice.”

### No hangar available? No problem.

There are several hangar-in-a-can “solutions” available:

**Glycol** is the most expensive and generally only available at select FBOs. **Polypropylene antifreeze** is pink in color, not harmful if swallowed, and is available at RV, automotive or marine stores and is used for winterizing portable water systems. Placed in a small garden sprayer it works quite well, especially if heated to room temperature.

**Automotive windshield de-icer in a spray can** is inexpensive and can be purchased at gas stations and department stores. Do not use it on aircraft windshields or windows. It’s the easiest to carry and unless the airframe is heavily iced, will yield several applications. **Rubbing alcohol**, sold in relatively small quantities in drugstores and supermarkets, can work in a pinch



*A garden sprayer can be used to help remove frost.*

using a spray bottle with a hand pump. With the exception of Glycol, these products are inexpensive to purchase and *should be used liberally. Remember, we’re talking about becoming airborne!*

Cleaning off the windshield is slightly different. Some pilots clear the aircraft’s windshield by using a *clean* towel or shop rag. Other pilots start the airplane and wait for the defroster to do the job. This could take a while in cold weather at idle power. Both of these techniques work without damaging the windshield. **Do not** use car ice scrapers, credit cards, or any other hard plastic device to remove frost or snow from the windshield. Do not taxi until you can see enough to move safely. No cheating!



*“Hangar-in-a-can” products are small enough to fit in a flight bag.*

Finally, remember that do-it-yourself airframe decontamination will take awhile, in cold, often-windy conditions. A light flight jacket and tennis shoes, while stylish, do not work well. A parka, boots, gloves and a hat will encourage you to give this critical job the time and attention it deserves.

Want to learn more about winter flying? Take a look at *Aircraft Icing*

<http://www.aopa.org/asf/publications/sa11.pdf>

and *Snow time*

<http://www.aopa.org/asf/asfarticles/2001/sp0112.html>

To access the AOPA Air Safety Foundation accident data visit

[www.aopa.org/asf/accident\\_data/](http://www.aopa.org/asf/accident_data/)

This Safety Brief was funded by the generous support of the Emil Buehler Trust.

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Publisher: Bruce Landsberg • Editors: David Wright, Kristen Hummel

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SB02-12/04